March 24, 2014

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DESIGN

CONFERENCE REPORT

PROJECT: 13080
NH Route 108
Durham/Newmarket

DATE OF CONFERENCE: February 20, 2014

LOCATION OF CONFERENCE: NHDOT - Concord

ATTENDED BY:

NHDOT	NHDES	Consultants & Municipal
Ron Grandmaison	Chuck Corliss	Gary Lemay (Gomez & Sullivan)
Wendy Johnson	Gino Infaselli	Diane Hardy (Town of Newmarket)
Melodie Esterberg		
Ann Scholz		
Tim Mallette		

SUBJECT: Report status & round table discussion of HEC RAS modelling & project timelines

NOTES ON CONFERENCE:

Introductions were made followed by a summary of the information gathered to date and the need to move ahead with the project that has an advertising date of April, 2014.

Diane Hardy provided background information on the Letter of Deficiency from the NHDES Dam Bureau that notified the Town of Newmarket of actions necessary to bring the dam into conformance. Hydraulic Modelling of the Lamprey River has been performed by UNH and independently, but with good communication with UNH, by Wright-Pierce. The ongoing feasibility study by Gomez & Sullivan has initial deliverables scheduled for April 2014 and a final report due after a public review. The dam will need to pass more water than it is currently designed for because the 100 yr. flow predictions, as defined in the Administrative Codes (Env-Wr 100-800) have increased. Diane mentioned that public outreach is required as part of the dam design. She said that it is imperative to professionally present the modeling to the public. Initially the issues came to the Town as a citizen's petition, and the Town has been working with NHDES in good faith with public support for the ongoing process. She indicated that the Town is "maxed-out" in funds for work on the dam project. The end of the contract for the feasibility study is June 2014.

Gary Lemay explained the scope of the feasibility study and that there is a certain level of engineering necessary (within the confines of the contract scope & budget) to study the flow split in the "Durham Flats". The budget for this project is running low. Gary said that the Lidar appears to have been acquired during a wet period and its use is limited in some areas. He explained that information has been gathered from the old FIS background files in addition to the UNH model. Three options were identified:

1. Remove the Dam
2. Modify the Dam (design and new spillway)
3. Keep dam but design for overtopping

*The Dam Rules do not allow manual operation of gate structures.

*The existing spillway crest gates do not provide enough capacity for the design flow.

Gary explained the challenge of modelling the "Durham Flats flow split" within a gradually varied steady flow HEC RAS model. This type of modelling assumes that water flows perpendicular to the cross sections or that it can be "still ponding", eddies are not accounted for. Gomez & Sullivan is using the same method to model the NH 108 embankment as the UNH model (a long bridge with openings), however significant aspects have been refined that may allow for evaluating frequencies other than the 100 yr. flow. Some minor differences were cited too, such as weir coefficients. He also explained that some of the HEC RAS runs will be modelled with the Veteran's Bridge as an obstruction in an open channel rather than with energy loss through the bridge algorithm in HEC RAS (the results will be compared with the traditional bridge analysis) This approach is used because the hydraulic control is within the bridge. He has incorporated extensive bathometry within the Lamprey River and additional ground survey from a Town of Durham project at Longmarsh Road performed by CMA Engineers. Clarification was provided by the Department for the Hamel Brook bridge structural geometry and other existing and proposed culverts along NH 108. Gary said that calibrating the model is difficult with the paucity of data available.

Ann Scholz asked about bathymetry around Moat Island and Gary Lemay said that there is a channel. Ann then asked if there were comparisons made with her model, specifically with regard to the assumptions used. There are significant differences between the models in the vicinity of Moat Island and it is likely that some of these aspects will be detailed in the Gomez & Sullivan draft feasibility report or in the public review that will follow prior to the final report.

Chuck Corliss explained that the Wright Pierce hydrology is being used for dam design purposes and that it is different than the UNH hydrology. Specifically, Technical Paper 40 provides additional adjustment curves that were used to estimate the Probable Maximum Flood (PMF). He also mentioned that this is different hydrology than what is typically used for highway design purposes. Chuck went on to say that in general the USGS gage data is different than the extreme precipitation hydrology used for dam reconstruction & design. He indicated that NHDOT is looking at Pre & Post conditions relative to the highway corridor which is a lesser amount, or higher frequency storm. After the meeting Tim Mallette pointed out that the UNH hydrology used Muskingum Cunge reach routing and that Wright Pierce used the Storage Index plus Translation method within their Hydro CAD model. The Wright-Pierce model used the time of concentrations that were optimized by Ann Scholz while at UNH for use in the HEC HMS hydrologic routing. Gary Lemay confirmed by phone the statements made in the last two sentences.

Ron Grandmaison and Ann stated that "all bets are off" once NH 108 overtops. Gary pointed out that a gradient is needed to make water flow. All agreed that the Durham Flats are a bathtub. Chuck Corliss added that for the public "over the road" is only an extreme event. The public seems to be more focused on the lower flows or more frequent storms with respect to the highway project. Ron mentioned that Fish & Game owns an extensive parcel just northwesterly of Moat Island. He also noted that the Department's Executive Office has the Hamel Brook Bridge rehabilitation or replacement "on the radar". Ron said that he would need to adequately respond to the comments from the Durham Boat Club for the project to proceed. He is scheduled to meet at the Durham Boat Club on March 19, 2014 to review issues, such as high water marks, on site.

Submitted by:

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NHDOT Design Services

TSM/tsm

cc: attendees